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Picture: WWF – Canon/Sandra Mbanefo Obiogo

Lake Malawi, one of the world's most biodiverse lake basins.

GROWING THREAT TO FRESHWATER

By **JAMIE PITTOCK**,

Director, Global Freshwater Programme, WWF

THE primary purpose of national parks and other protected areas is to conserve viable and representative populations of species and ecosystems in perpetuity. So how can this be achieved for freshwater species and habitats?

Freshwater habitats are those ecosystems that depend on water flows for their environmental health, and can include caves, swamps, floodplains, rivers, lakes, salt pans and estuaries. The term 'wetlands' is often used to describe these habitats (a term that the Ramsar Convention on Wetlands uses to include marine habitats less than six metres/20 feet deep).

Estimates of the global extent of wetland habitats range from 5.7 to 12.8 million sq km/2.2 to 4.9 million sq miles. The extent of wetlands in protected areas is also hard to measure. Ramsar sites covering around 100 million hectares/38,610 sq miles include freshwater habitats (but include some terrestrial and marine habitats too), around 7.8% of the larger estimates of the world's freshwater habitats.



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kyrgyzstan

SNOW LEOPARD SANCTUARY ON THE SILK ROAD

by JOHN FARRINGTON

SARYCHAT Ertash Nature Reserve, Kyrgyzstan's largest protected area, was created in 1995 to protect snow leopards, their prey species, and the fragile mountain ecosystems of the inner Tian Shan. The reserve is located in the heart of the Tian Shan between Lake Issyk Kol and the Chinese border, and straddles the high plateau grasslands, glacier fields and plunging river gorges of the Ertash River basin.

The reserve has an area of 1,341 sq km/518 sq miles, and elevations ranging from 2,500 m/8,200 feet at the mouth of the Ertash River to a maximum of 5,125 m/16,815 feet in the ice fields of the Ak Shirak range. Gathering in tundra bogs just east of the divide which separates its headwaters from those of the Syr Darya, the 90 km/56 mile long Ertash River flows the entire length of the reserve before joining the Sary Jaz River, which flows into China and disappears into the sands of the Taklamakan desert.

Ecosystems within Sarychat Ertash include tundra, wet alpine meadows, arid grass and brushlands, and an extremely limited number of Tian Shan spruce, which grow in an isolated area of sparse relict forest at the easternmost end of the reserve.

The reserve's offi-

cial 2003 wildlife survey included 1,450 Marco Polo sheep (various subspecies of *Ovis ammon*), 840 ibex (*Capra sibirica*), 13 snow leopards (*Uncia uncia*), 12 Pallas cats (*Felis manul*), 10 Tian Shan bears (*Ursus arctos isabellinus*), 53 wolves (*Canis lupus*) and 2,700 marmots (*Marmota menzbieri*). However, the chief biologist at the reserve, Alexander Vereshchagin, readily concedes that these numbers are overestimates since they represent the composite observations of all rangers working in the reserve, and include many animals counted in the process of migrating through reserve territory.

Since ancient times, the passes to the south and west of Sarychat Ertash have been plied by nomadic herders who moved seasonally into the high Tian Shan for summer grazing in alpine pastures. Following the outbreak of the Second World War, in a push to

increase wool production for manufacture of Red Army uniforms, sheep populations were dramatically increased in Kyrgyzstan from roughly 2.5 million in 1941 to about 10.3 million in 1989.

In order to accommodate these burgeoning sheep numbers, numerous herding collectives were established in the high Tian Shan, including two collectives which were established in the late 1960s on the present-day territory of Sarychat Ertash. These two collectives were occupied year-round by approximately 40 herders who lived in cabins or yurts and looked after roughly 25,000 sheep, 2,500 yaks, 250 horses, and 50 camels.

With the collapse of the Soviet Union, these two collectives were quickly disbanded, and herders in the Ertash valley returned to their home villages on the southern shores of Lake Issyk Kol, completely depopulating the area of the present-day reserve. This process of "de-development" in the inner Tian Shan has provided remarkable benefits for conservation in the region, and with the herders and their sheep gone there was little to block creation of the remote Sarychat Ertash reserve in 1995.

Over the course of the last nine years the reserve has made an almost miraculous transformation from an intensively used pastureland to an isolated wilderness area with thriving populations of



The skull of a Marco Polo sheep. The breed has quickly reoccupied the Sarychat Ertash area since the departure of Soviet collective farming.

Marco Polo sheep and ibex, which quickly reoccupied the area after the departure of the collectives.

Due to the disbandment of Soviet-era road maintenance crews, the roads to the reserve are no longer navigable for many months of the year, being blanketed in deep snow from January to April, periodically blocked by avalanches from April to June, and intermittently flooded by snow melt, glacier melt, and rainfall from June to September. Most bridges and creek culverts have long since been washed away and never replaced. This situation forces rangers based in the only community on the south side of the reserve, the village of Ak Shirak, to lay in enough supplies to get them through the long winter months until roads re-open in the spring.

The rangers at Sarychat Ertash have, however, made good use of the collective infrastructure abandoned by the herders who formerly occupied the reserve, maintaining seven herders' cabins which are strategically located a half day's horse ride apart along the entire length of the reserve. These cabins serve as ideal bases for patrolling the park and conducting wildlife surveys in the harsh, high-altitude environment of the Inner Tian Shan. Nevertheless, getting about in Sarychat Ertash is no easy matter, as a journey within the reserve last July was to show.

The 200 km/125 mile drive from the nature reserve's headquarters at Barskoon, on the southern shore of Lake Issyk Kol, to the Koenduu ranger camp, in Sarychat Ertash's southern buffer zone, takes a minimum of six hours, though frequently much longer depending on road and weather conditions. Formerly a winter herding camp, Koenduu's adobe structures are located at the foot of the Ak Shirak range at an elevation of 3,400 m/11,155 feet, and are occupied year round by a reserve ranger and his family.



Sarychat Ertash staff in front of a newly-erected enclosure set up to examine grassland productivity.

Pictures: John Farrington

Like all 14 rangers at Sarychat Ertash, the family grazes approximately 200 sheep in the meadows around their camp to supplement a meagre US \$20 per month ranger's salary paid by Kyrgyzstan's state forest service. Although the area immediately around the camp is a bleak landscape of denuded pasture that has yet to recover from collective era overgrazing, the camp is surrounded by spectacular views of vast glacier fields hanging cloud-like on the horizon, atop the border ranges to the south across the broad Ak Shirak river valley. Just upstream from the camp there are stunning views of cascading glaciers flowing eastward out of vast ice fields.

Lacking adequate camping equipment and rain gear, the under-equipped rangers are extremely vulnerable to hypothermia in the event of heavy rain, snow, or a fall while fording a river on horseback. This is especially true while they are away from one of their established camps, as there is no wood available for campfires in most of the reserve.

Protection of Marco Polo sheep, also known as Argali sheep — the Central Asian big-horn — is one of the highest priorities at Sarychat Ertash, as these sheep comprise the chief source of food for the reserve's small snow leopard population. Although the term Marco Polo sheep originally referred to

one specific sub-species, *Ovis ammon polii*, in practice in Kyrgyzstan and throughout the former Soviet Central Asian republics the term Marco Polo sheep is commonly used to refer to any of the five sub-species of *Ovis ammon* found in the Pamir, Tian Shan and Altai ranges. The largest of the wild sheep, Marco Polo sheep can weigh up to 180 kg/400 lbs, have horns up to 190 cm/75 inches in length, and typically live between eight and 12 years.

The species has been in decline for decades due to increased competition with domestic livestock for high mountain pasture resources during the collective era, increased poaching for meat by local herdsmen and, of late, increased trophy hunting by foreign hunters. The population of Marco Polo sheep in Kyrgyzstan was estimated to be approximately 9,000 in the mid-1980s, which had declined to an estimated 7,500 animals by the mid-1990s. Today the number of Marco Polo sheep in Kyrgyzstan is continuing to fall, and the species is presently listed as "vulnerable" on the International Union for the Conservation of Nature's (IUCN) Red List of species.

Prized by trophy hunters for their enormous horns, the largest threat to Marco Polo sheep at Sarychat Ertash now comes from five upscaled hunting camps that have been established just outside the



borders of the reserve. The camps cater to affluent European and American hunters who are helicoptered in and who will pay up to US \$29,500 for a one-week Marco Polo hunt.

These camps are just a few of dozens operated by sport hunting companies in Kyrgyzstan which advertise their services on the internet. Although trophy hunting is potentially a source of income to fund conservation efforts at the reserve, the entire US \$10,000 hunting permit fee currently disappears directly into the coffers of the national and provincial governments, with none being distributed directly to the reserve.

The snow leopard, an elusive creature that very few people have seen in the wild, is a highly specialised animal that dwells almost exclusively on wind-blown ridges above the tree line in the mountainous interior of Asia, ranging from Tadjikistan to Mongolia and from southern Siberia to Nepal. From these open vantage points, the snow leopard is able to survey miles of territory in all directions as it patiently waits for prey to enter its field of view.

Listed as endangered on the IUCN's Red List of species, the snow leopard population in Kyrgyzstan has been decimated by poaching in the last 20 years and has fallen from roughly 1,500 animals in the mid-1980s to an estimated 150 remaining today. Valued for their fur and as a substitute for tiger parts in traditional Chinese medicine, Kyrgyzstan's snow leopards, although officially protected, have been hunted relentlessly. Poachers typically set jaw traps along snow leopard migration routes in mountain passes and along ridgelines, and can sell pelts for US \$2,000 on the thriving Asian black market while live cubs are said to sell for as much as US \$20,000.

At present, the reserve's chief biologist estimates that

there are six snow leopards which permanently inhabit the reserve. Through increased patrols and monitoring of the population, the reserve staff believe they have succeeded in halting all poaching activities in the territory of the reserve today. However, hunting camps along the perimeter of the reserve compete directly with snow leopards and local wolves for Marco Polo sheep, and may contribute to the geographical isolation of the small snow leopard population within Sarychat Ertash.

While this fantastic wilderness zone is nominally part of a UNESCO Biosphere Reserve that encompasses Kyrgyzstan's entire Issyk Kol Province, Sarychat Ertash has yet to reap any benefits from biosphere designation. International efforts regarding biosphere management are currently focused on the heavily touristed lakeshore area of the province, which attracts thousands of visitors from the former Soviet countries and further afield to its beaches each summer.

However, two international projects have directly benefited Sarychat Ertash. The International Snow Leopard Trust (ISLT) held a Snow Leopard Information Management System (SLIMS) training course in 2003, which introduced park staff to standardised methods for recording and exchanging information about snow leopard populations and their prey species. Also, an

ISLT-sponsored Snow Leopard Enterprises training course taught local residents of Ak Shirak how to produce handicrafts which ISLT purchases for sale at zoos and museum gift shops in the United States.

In addition, the UK-based Fauna and Flora International — in conjunction with a local NGO, the Community and Business Forum — sponsors a small grants programme for community-based conservation and sustainable development projects in the Issyk Kol and Naryn provinces of eastern Kyrgyzstan, which residents in the area around the reserve are eligible to participate in.

The poaching problem that plagued wildlife in the reserve immediately following independence has been reined in by the concerted efforts of the Sarychat Ertash staff, allowing Marco Polo sheep and ibex in particular to thrive in the reserve, but problems remain. With a relatively small, isolated area which is not contiguous with any other protected areas, it is unlikely that the reserve will be able to maintain the genetic diversity needed to sustain healthy, viable populations of the increasingly rare snow leopards, Tian Shan bears and Pallas cats that occupy the reserve and are rapidly being hunted to extinction outside its boundaries.

Prospects for expanding the reserve's territory are poor at the moment, expansion being blocked on all sides by the neighbouring



Glacier fields and tundra meadows at the western end of the Sarychat Ertash.



Above: Chief Biologist Alexander Vereshchagin in front of a sign for the Sarychat Ertash State Nature Reserve. Below: Ranger Kai with his horse on patrol in the western core zone of the reserve.



hunting camps which form a powerful lobby against expansion of the reserve's boundaries. Further obstacles to expansion of the reserve include mining interests, and in 2003 a team of prospectors carried out mineral explorations within the reserve itself. Although such activities are prohibited by law in Kyrgyzstan's protected areas, extraction of mineral resources is considered to be in the national interest, so relevant laws concerning protected areas in this respect often go unenforced.

It is anticipated that gold reserves at Kumtor mine will be exhausted by the end of the decade, and it is possible that

Sarychat Ertash may someday inherit the mine's licence area. The mine road and residential facilities could provide an excellent route to the reserve and accommodation for tourists. However, it remains to be seen if receipts from the short tourist season would prove sufficient to maintain the 100 km/60 mile mine road and the year-round maintenance that would be required to keep the quality of residential facilities at a level high enough to attract international tour groups.

Further potential threats to the ecological integrity of the Sarychat Ertash region come from other mining projects being developed in the area, the steadily increasing

demand for rare wildlife products in China, and a major highway proposed by Chinese interests which would stretch from Xinjiang to Lake Issyk Kol, crossing the Tian Shan about 25 km/15 miles south of Sarychat Ertash.

While the park staff is interested in promoting limited tourism within the reserve — such as well supervised horse treks or photo safaris, at present the lack of bridges (and materials to build bridges within the treeless landscape), as well as the lack of basic tourist infrastructure such as accommodation, transport,

access roads and even food, will prevent extensive tourism for the foreseeable future.

In its short nine-year existence, the successes of the grand experiment underway at the Sarychat Ertash Nature Reserve have been remarkable, with the formerly intensively grazed Ertash valley having reverted to a viable wilderness with large populations of Marco Polo sheep and ibex. Just as remarkable have been the dedication and success of the reserve staff in slowing the long precipitous slide towards extinction of the snow leopard population in the reserve, especially in light of their almost non-existent salaries, and their general lack of equipment and adequate winter gear.

However, threats to the ecological integrity of the reserve continue to exist on all sides, and it remains to be seen whether the struggle to preserve this unique corner of the Tian Shan can be won, given the multitude of economic pressures that increasingly weigh in on the area.

* JOHN FARRINGTON is a Fulbright Fellow who has been researching pastoral land use and protected areas in eastern Kyrgyzstan for the past year. He has spent the previous four years examining environmental and conservation issues in Mongolia and the People's Republic of China. Any questions regarding this article may be forwarded to him at doeage@excite.com

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